Airport Configuration Planner with Optimized Weather Forecasts, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

The core planning algorithms to support the NGATS concepts will need accurate predictions of airport configuration over planning horizons of six hours or more. Such predictions are not currently feasible because the configuration often is not completely determined by factors such as weather forecasts, future demand, and noise restrictions that might be input to an automated predictor. When this is the case, the air traffic control tower personnel choose between the feasible configurations based on factors such as staffing issues and individual controller preferences. Furthermore, the primary meteorological forecasts currently available to the tower are not adequate to enable accurate runway usage prediction. In fact, they often fail to predict required changes in flow direction, causing reactive rather than proactive airport configuration management. In this SBIR, Metron Aviation and WSI Corporation will jointly develop an airport configuration planner incorporating optimized weather forecasts to assist tower controllers in planning runway usage more accurately at longer time horizons than currently possible and to communicate the plan to appropriate National Airspace System (NAS) stakeholders and planning systems. The optimization algorithms in this decision support tool will improve resource allocation not only at individual airports but also over all airports in a metropolitan area.

Anticipated Benefits

The FAA will require the planner developed in this SBIR to implement the NGATS vision. The optimization algorithms in this tool will improve airport throughput and efficiency; whilst the tower controller feedback in the planning process will maintain flexibility. By basing the plan on improved meteorological forecasts, airport configuration management will be more proactive and less reactive. By automating the communication of the plan between FAA facilities, air traffic management coordination will be improved. It will assist communication between a TRACON and towers within that TRACON to plan and implement configuration changes. It will automate the communication of planned configurations and arrival and departure rates to the FAA Command Center, which will improve the planning of traffic management initiatives such as GDPs. The configuration planner will also communicate the configuration plan to FAA customers, allowing them to improve their planning to better achieve their goals and objectives.

Airport Configuration Planner with Optimized Weather Forecasts, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)
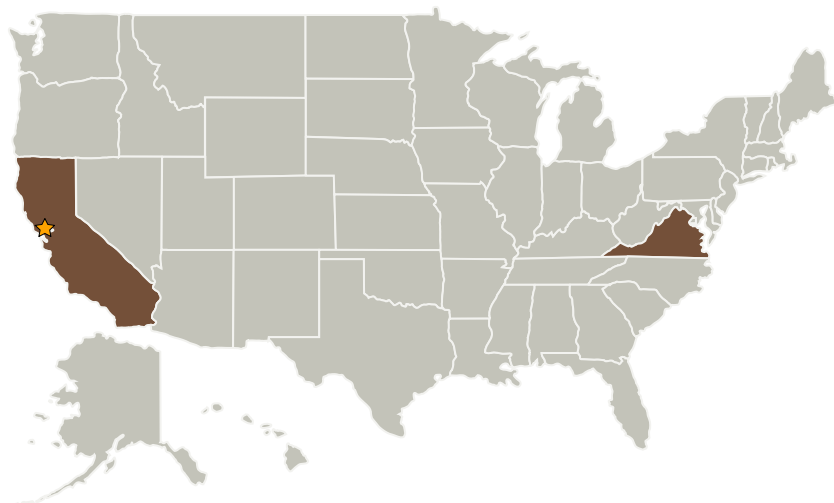
Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

For more information and an accessible alternative, please visit:
https://techport.nasa.gov/view/6360

Primary U.S. Work Locations and Key Partners

Organizations Performing Work	Role	Type	Location
⭐Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Metron Aviation, Inc.	Supporting Organization	Industry	Dulles, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Project Manager:
Katharine Lee

Principal Investigator:
Laurel Stell

Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  └ TX16.3 Traffic Management Concepts